

**Title:**

Filling Soil Health Prescriptions with Targeted Cover Crop

**Project Leader(s):**

Sustainable farming requires close attention to soil improvement. This project will let vegetable producers use the new Cornell Soil Health Test (CSHT) to identify what needs improvement, and select cover crops that specifically address those needs. Most of the project will be carried out on grower farms, expanding existing relationships that have been developed around soil health, and responding to growers' desire to act on the new information they get from the CSHT. Most current cover crop recommendations are too general; we will provide locally appropriate targeted guidance for specific soil management goals.

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**Cooperator:**

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**Abstract:**

In 2009, John Mishanec worked with 12 vegetable growers in Eastern NY to use the CSHT and the cover crop decision tool to determine the most suitable cover crop for their situation. Next spring, the growers will plant that cover crop in a split-field trial and evaluate its performance with a subsequent vegetable crop. Many more will see outreach talks and articles.

**Objectives:**

This project will let vegetable producers use the new Cornell Soil Health Test (CSHT) to

Farm trials will strengthen recommendations regarding how much each of the ten most common cover crops, and complementary combinations of them, reduce un-aggregated soil, increase aggregate stability, and reduce surface hardness.

identify what needs improvement, and select cover crops that specifically address those needs. The project will be carried out on grower farms, expanding existing relationships

This project is led by Thomas Bjorkman of Cornell University and the project team is composed of six Extension educators who will engage growers in four states (NY, PA, MA and VT).

that have been developed around soil health, and responding to growers desire to act on the new information they get from the CSHT. We will provide locally appropriate targeted guidance for specific soil management goals.

**Background and justification:**

In the course of doing cover crop recommendations and implementing the CSHT, growers have repeatedly asked members of his project team for more specifics on the benefits to expect from cover crops. At presentations on the SARE-funded project on

buckwheat as a weed management tool, growers ask for more information about the soil conditioning benefits. Using cover crops for soil health has been requested by growers at

**Goal 1.** Train team. For staff training and feedback to the soil health team, all the project staff will meet to discuss the interpretation of 2009 soil health tests that recommend cover crops. This exercise will increase the clarity and consistency of our message to growers. It is important for us to understand the limitations of the test, in particular the amount of variation that can be considered significant. The Cover Crop decision tool, new for 2008, so all will need some orientation. The workshop will meet for a full day near Albany after CSHT reports are in.

**Goal 2.** Improve decision tool. Increase integration with Managing Cover Crops Profitably (MCCP). This SARE publication is the definitive comprehensive guide to cover crops. The decision tool used in this project complements it by focusing on the precise information growers need to make decision. It aids growers by filtering out information that is not relevant in this region and information that is not needed in order to choose an appropriate cover crop. Our production information is highly focused; a local interpretation of what is covered in MCCP. Many growers will want the additional information in MCCP once they have made a decision or have begun to grow the cover crop.

the Cornell Organic Program work team in each of the last three years. The extension field staff will be implementing this project at farms where the growers have already been asking these questions and have asked for the guidance this project will deliver.

## **Procedures**

**Goal 3.** John Mishanec will enlist 12 growers to get Cornell Soil Health Tests. The first growing season will begin by collecting soil health tests. To make the data interpretable, the guidelines call for collecting samples before spring tillage. The project staff will work with interested growers to target fields that they feel are not producing to their potential, or have shown problems often improved by cover cropping, such as root rot or low tilth. Some will already be engaged with the Soil Health Team. Each of the extension field staff has identified likely participants in their area. The prior selection of growers will reduce attrition in later milestones.

Field trial will be conducted for two years on research-farm sites with different The ten most common cover crops, and complementary combinations of them, will be sown in two fields that differ in soil texture and intermediate values for the key soil quality parameters.

**Goal 4.** Growers will plan to plant a cover crop based on their soil health test. Many of the growers' CSHT report will recommend cover crops. Of those, most will select and plant an appropriate cover crop. A few growers who had soil health tests done in 2009. A pilot group among those growers will achieve this milestone in 2009 and the remainder in 2010.

#### **Results and discussion:**

During the summer of 2009, twelve growers from throughout eastern NY were enlisted to take Cornell Soil Health tests. Taking the samples was an opportunity to educate growers about bacterial problems, root diseases, rot, tuber disorders, and the benefits of biological control from using cover crops. Samples were sent to Ithaca. The soil health test results were sent out in December of 2009 and in early 2010, meetings will be held with each of the grower. Results will be discussed and specific cover crops will be selected to individually address the results on each farm.

Problems in vegetable production are often caused by soil conditions. Specific problems are identified on each grower's soil test results. Weather the problem can be traced to poor drainage, poor microbial activity, build up of disease, low organic matter, etc. there is a cover crop that will help address the problem. Growers will be able to reduce the amount of environmental degradation (reduced soil quality), yield loss and improve profits. One of the foundations of agriculture is "to build a good crop, you have to build a good soil". Information from the soil health tests and the resulting cover crop trials will address this issue.

When growers can use a cover crop and manage pest problems without using a pesticide, it is a benefit to the environment. It will also reduce cost to the growers and hopefully increase crop yields. In the first year, three hundred acres will be impacted by the project. This project will encourage grower to try different cover crops other than they have used previously. Many growers are reluctant to take a field out of production for any length of time. If the benefits can clearly be shown to growers of using cover crops to address problems, than the goals of the project will have been reached. Neighboring

growers will benefit from the growers involved in the trial. One of the goals of the project is to use cover crops that cost around \$30 or less. This is a reasonable cost/benefit ratio as often growers state using cover crops as cost prohibitive.

**Project Locations:**

Growers from Dutchess, Ulster, Albany, Schoharie, Washington, Oneida and Clinton Counties participated in the Soil Health testing.

**Keywords**

Bacteria

Root disease

Biological control

Pesticide reduction